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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,453	02/18/2005	Karsten Reihs	785-012125-US (PAR)	5072
2512	7590	09/28/2009		
Perman & Green, LLP 99 Hawley Lane Stratford, CT 06614			EXAMINER WHITE, DENNIS MICHAEL	
			ART UNIT	PAPER NUMBER
			1797	
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			09/28/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,453	Applicant(s) REIHS, KARSTEN	
	Examiner DENNIS M. WHITE	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/04/2009 has been entered. Claims 1-12, 17-20 are pending.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-7, 10-12, 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beecher et al (WO 00/67293) in view of Dreyfus (USP 5,854,486).

Regarding claim 1, Beecher et al teach a MALDI sample carrier with a surface formation with a multitude of MALDI matrix points, characterised in that the MALDI matrix points are deposited ("applied to the sample carrier") from the liquid phase (Pg. 11 lines 4-15). Beecher et al teach the polytrifluoroethylene film ("surface formation has a first layer with an ultraphobic surface") and substrate layers ("carrier layer" "several layers") (Figure 1: 101 and 102) applied by screen printing, electrospray, and making the area prior to deposition ("applied reversibly on a carrier layer"). Beecher et al. teach the thickness of the polytrifluoroethylene film is preferably 100 microns thick (Pg. 7 line 30). Beecher et al is silent about the MALDI matrix is applied by precipitation of a

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MALDI matrix substance from the gas phase, preferably by sublimation and the deviation is <100 micrometers over 100mm.

Dreyfus teaches a MALDI sample carrier in which the MALDI matrix material is deposited from the gas phase on to a substrate by sublimation. The MALDI matrix film 20 is preferably thicker than 1 nm, more preferably thicker than 10 nm, and most preferably thicker than 100 nm which allows efficient use of the laser light to desorb the film. As the MALDI matrix films grown thicker than 1 micron, the surface becomes rougher. However, the method may still be used to produce films 20 of 10 microns and thicker. The thickness uniformity of the film across the area to be illuminated by laser beam 4 is preferably more uniform than +/-50%, and most preferably more uniform than +/-10% of the average film thickness. If the variation is 10% with the thickness of the film is 10 microns, the deviation would be 1micron which reads on the claimed deviation of <100 micrometers. It is desirable to deposit the matrix material by sublimation from the gas phase because it provides pinhole free layers and the ability to vary the seed crystal density (col. 4 lines 26-51). It is desirable to provide the film with a uniform thickness more uniform than +/- 10% as pointed out by Dreyfus (col. 4 lines 46).

Therefore it would have been obvious to one of ordinary skill in the art to perform the depositing step of Beecher by using the known step of depositing by sublimation of the gas-phase MALDI matrix because it provides pinhole free layers of MALDI matrix and the ability to vary the seed crystal density.

Therefore it would have been obvious to one of ordinary skill in the art, as motivated by Dreyfus to provide the MALDI matrix film with uniform thickness more

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uniform than +/-10% of the thickness of the Beecher MALDI matrix in order that the whole surface is covered with the matrix.

Regarding claim 2, Beecher/Dreyfus teach manufacturing the film above wherein the film ("plate") (Figure 1:102) covers the substrate ("sample carrier") (Figure 1:101) during the precipitation from the gas phase, which has openings ("plate has through holes whose cross-sectional area corresponds to the cross-sectional area of the respective MALDI matrix points") where the matrix is deposited (Pg. 11 lines 4-15).

Regarding claims 3-5, Beecher/Dreyfus teach that the film has a plurality of openings that are arranged in an orderly fashion for easy addressability ("plate has at least one further through hole by means of which information is transferred to the sample carrier by precipitation of the MALDI matrix substance from the gas phase" "alignment points" "MALDI matrix points are arranged along a grid") (Pg. 8 lines 7-8).

Regarding claim 6, Beecher/Dreyfus teach the openings can comprise both affinity surface to capture the analyte and adding the energy absorbing material ("MALDI matrix points have substructures") (Pg. 2 lines 6-8).

Regarding claim 7, Beecher/Dreyfus teach the openings containing the MALDI matrix points are separated into several partial points, preferably isolated from one another (Figure 1: 103).

Regarding claim 10, Beecher/Dreyfus teach the matrix comprises cinnamic acid derivates such as .alpha.-cyano-4-hydroxycoumarin acid (Pg. 5 lines 31-34 and Hutchens et al USP 5,719,060 col. 6 lines 30-35).

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Regarding claim 11-12, Beecher/Dreyfus teach the film comprises polymers such as polytrifluoroethylene and the matrix is cinnamic acid (“characterised in that the sample carrier has an ultraphobic surface” “characterised in that the MALDI matrix points or partial points represent hydrophilic areas which are completely surrounded by ultraphobic areas”) (Beecher: Pg. 5 line 31, Pg. 8 lines 19-28 and Figure 1:103, 101).

Regarding claim 14, Beecher/Dreyfus teach device has a MALDI matrix with a +/- 10% of the average film thickness. Since the thickness can be 10 microns, the maximum local flatness deviation of the surface formation on a length of 100 mm would inherently be <100 μm .

Regarding claim 17, Beecher/Dreyfus teach the film can be epoxy resin (“characterised in that the first layer is glued to the carrier layer”) (Pg. 9 lines 1-5).

Regarding claim 18, Beecher/Dreyfus teach the film and substrate can be electrically conducting (“characterised in that there is an electrical contact between the first layer and the carrier layer”) (Pg. 6 line 17 and claim 5 line 1).

Regarding claim 19, Beecher/Dreyfus teaches a laser desorption time of flight mass spectrometer used with a probe comprising a film of self-assembled monolayer for example decane thiol on gold (“consisting of material impervious to water vapour and, preferably, impervious to light”) and MALDI matrix in the openings wherein the probe is in a vacuum chamber (“surrounded by a hollow body containing a vacuum”) (Pg. 10 lines 10-17).

Regarding claim 20, Beecher/Dreyfus teaches the openings or feature comprises binding functionalities such as antibodies (“additional biological material on the MALDI matrix point”) (Pg. 5 lines 7-15 and Pg. 12 claim 7).

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beecher et al (WO 00/67293) in view of Dreyfus (USP 5,854,486) and further in view of Nelson et al (USP 5,955,729).

Regarding claim 8, Beecher/Dreyfus teach the use of MALDI matrix such as cinnaminic acid derivatives, sinapinic acid and dihydroxybenzoic acid. Beecher/Dreyfus are silent about different MALDI matrix substances are applied to a sample carrier.

Nelson et al teach a method of identifying captured analytes using laser desorption/ionization in which same or different suitable MALDI matrix or matrices may be applied to the surfaces (col. 9 line 57-col. 10 line 23). It is desirable to use suitable MALDI matrix materials for analytes that differ in size.

Therefore it would have been obvious to one of ordinary skill in the art to apply different MALDI matrix substances to the sample carrier for the above advantages.

Regarding claim 9, Beecher/Dreyfus/Nelson teach the matrix in the openings (“that at least several MALDI matrix points or partial points each consisting of one MALDI matrix substance are built up”).

Response to Arguments

5. Applicant's arguments filed 9/4/2009 have been fully considered but they are not persuasive. Applicants argue that the layer does not inherently teach the surface

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deviation limitation of less than 100 micrometers. It is noted that Beecher in view of Dreyfus teach the MALDI matrix having a surface deviation of +/- 10% of the thickness. When the thickness is 1 micron, the surface deviation is less than 100 micrometers as claimed. Therefore the claimed limitations are met. The applicants further argue that the claimed range is not met by the prior art because the prior art merely discloses a deviation of 0.1microns or less. It is noted that the prior art discloses surface deviation that falls within the claimed range. Furthermore, the limitation merely claims the deviation must only be less than 100 micrometers, which the prior art teaches.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS M. WHITE whose telephone number is (571)270-3747. The examiner can normally be reached on Monday-Thursday, EST 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LYLE A ALEXANDER/
Primary Examiner, Art Unit 1797

/dmw/